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Event #1880

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The following component part numbers comprise the compilation report:

ADP010797 thru ADP010815

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USAF Force Protection Battlelab

Innovus Defensor Fortis

SO/LIC SYMPOSIUM BRIEFING

14 February 2001

Lt Col James A. Swaby



U.S. AIR FORCE

Lt Col James Swaby



U.S. AIR FORCE

Overview

- Background Information
- CBAWS Initiative
- DESS Initiative



U.S. AIR FORCE

AFFPB Vision

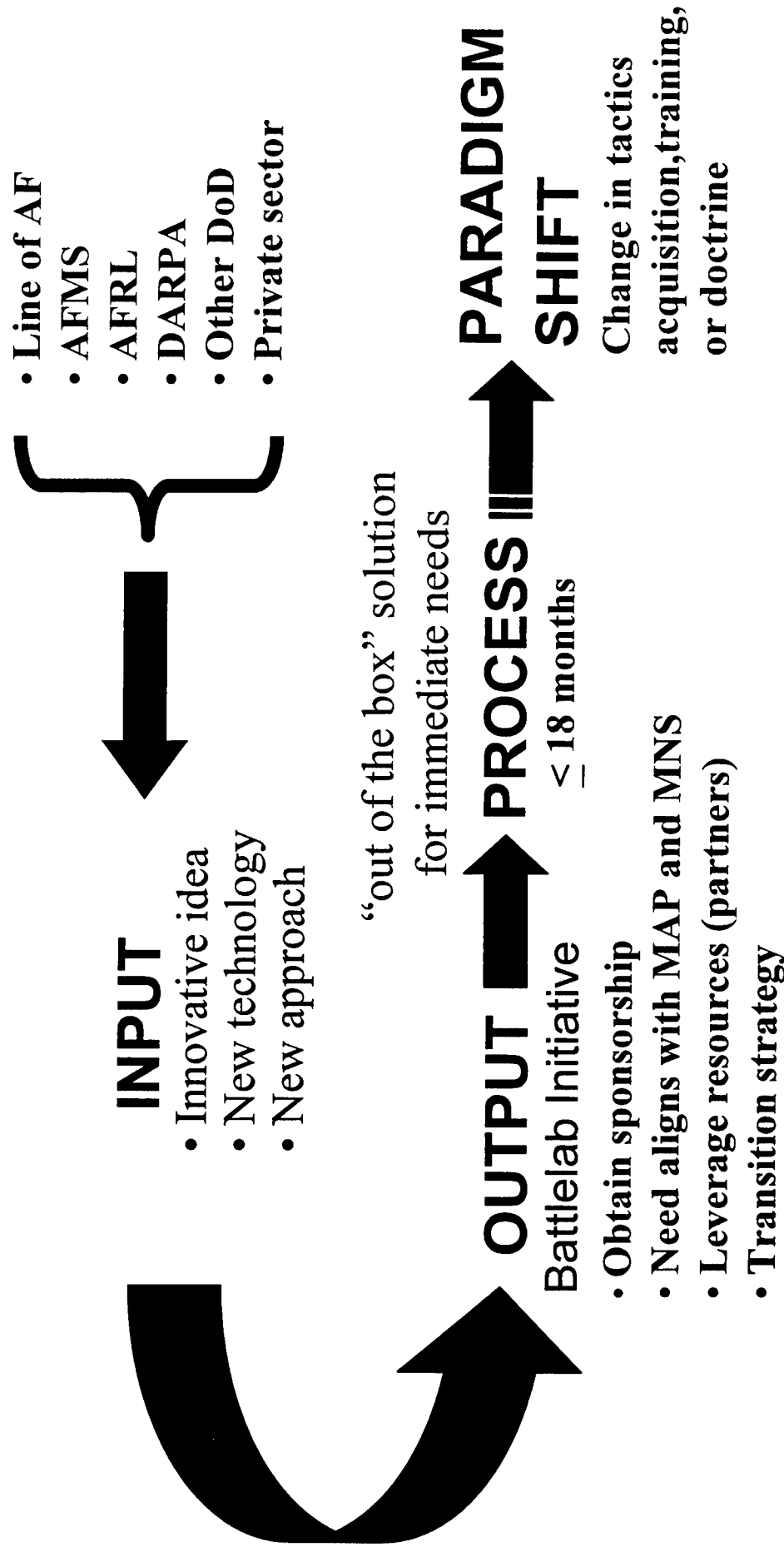
*“Provide an arena to measure the worth
of force protection concepts and ideas; driving
innovations in tactics, organization, and doctrine”*

Innovus Defensor Fortis



U.S. AIR FORCE

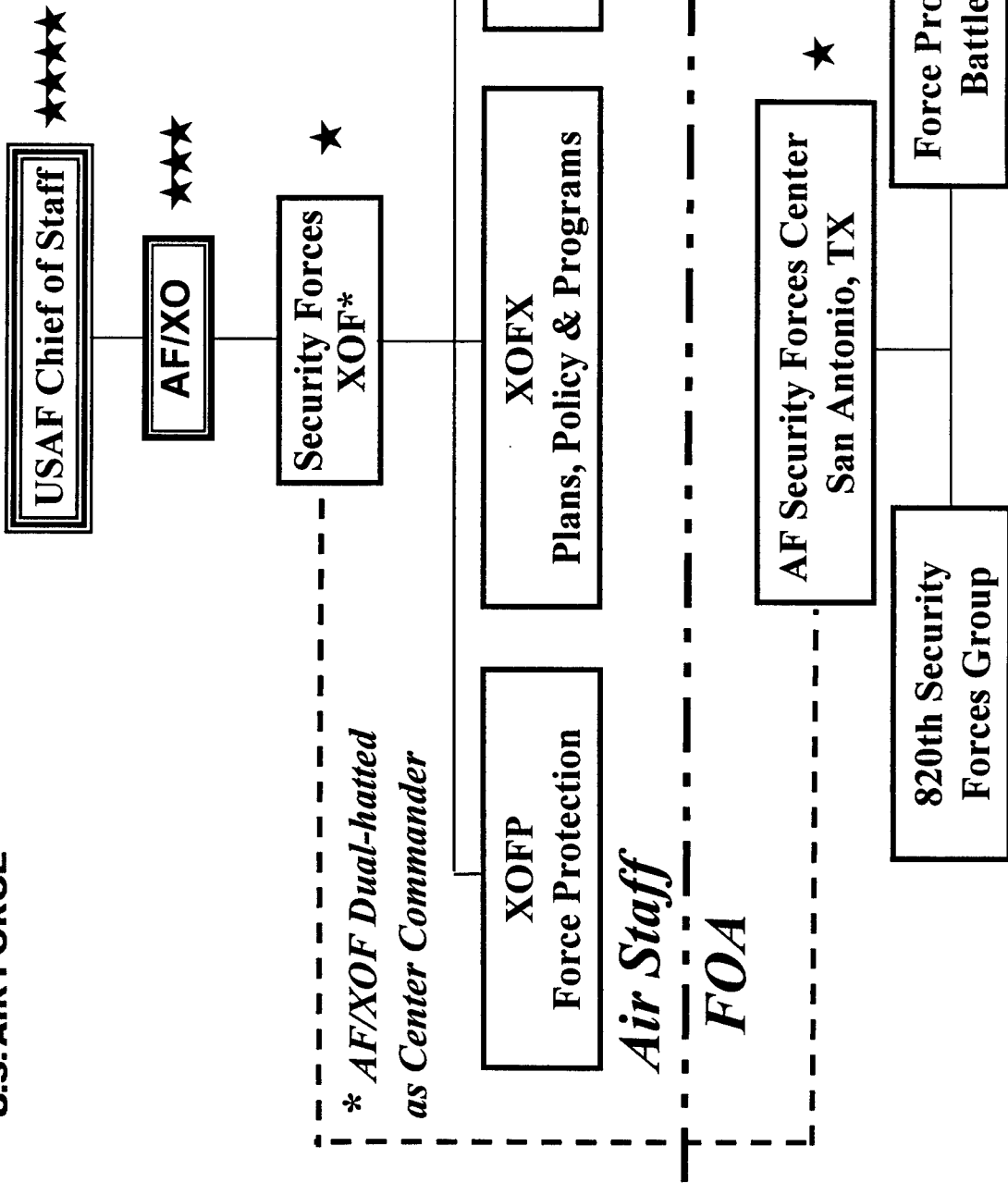
AFFPB Process





U.S. AIR FORCE

Security Forces Organization



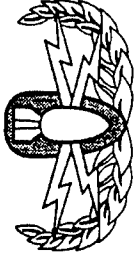


U.S. AIR FORCE

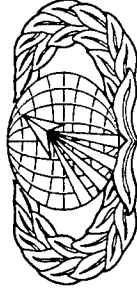
AFFPB Specialists



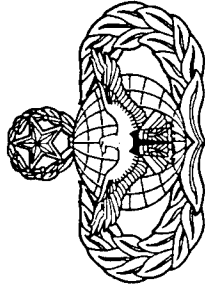
Structural Engineer



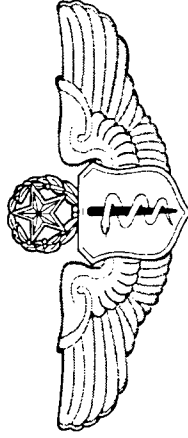
Explosive Ordnance Disposal



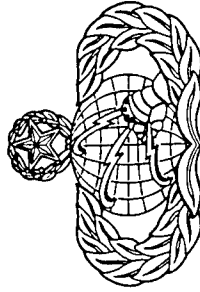
Scientific Analyst



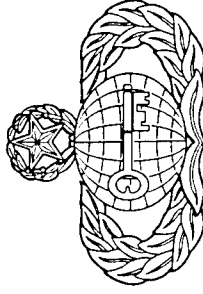
Security Forces



Flight Surgeon



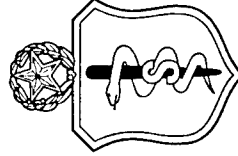
Communications



Intelligence



Command and Control



Entomologist



Readiness Technician

USAF Force Protection Battlelab

Innovus Defensor Fortis

Chemical-Biological Aerosol Warning System



U.S. AIR FORCE

Lt Col James Swaby



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Bottom Line

- A true alert-to-warn and alert-to-treat CBAWS is possible using COTS & GOTS equipment
- First CBAWS kit can be fielded in 6-12 months
- CBAWS is not the ideal, it has limits but it is possible to field a true alert-to-warn system



Initiative Description

U.S. AIR FORCE

Initiative Name: Chemical-Biological Aerosol Warning System (CBAWS)

Problem: We have no true alert to warn CB sensor system

Innovative Concept: Can we deploy a true alert to warn CB sensor system for the “first-in” rapid deployment forces?

Demonstration Mission Statement: Demonstrate the utility of using a tactical, agile prototype coupled chemical-biological (CB) sensor system for forward-deployed, first-in forces to provide notional early alert & warning capability of an aerosol attack employing chemical or biological agents

Solution set: Use existing technologies COTS & GOTS to devise a CBAWS

Partners: AFIP, MSBL, SBCCOM, 820 SFG, & 786 CRG

Proposed Sponsorship: HQ ACC/ILE &/or HQ ACC/SG



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Objectives

- **Provide a quickly deployable, small, portable, easy-to-use & maintainable perimeter CB sensor system network for generic “early alert to warn” & specific alert to treat capability**
 - **Contain a personnel alert & warning system (RF/pager link)**
 - **Use wireless COTS & GOTS technology**
 - **Make it one man portable & deployable**
 - **Maintain a small foot print**
- **Enhance force protection situational awareness & rapid decision making.**
 - **Alert to mask in <1 minute from CB detection**
 - **Facilitate phased employment of personal protection equipment**
 - **Reduce time to decision to remove personal protection equipment**



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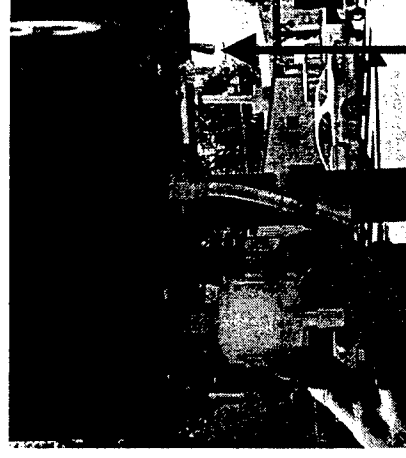
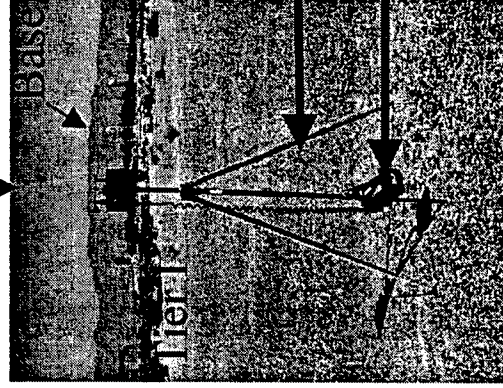
CBAWS Components

— Tier I

- Status: shelved by Army
- Sensor: particle detector
- Advantages:
 - True 13Km alert-to-warn stand-off
 - One-man portable/deployable, simple
 - Battery operated
 - RS 232 connection
 - Capable of collecting a sample



One-man portable
One-man deployable
Simple to operate



Sample filter Switch
Tripod
Battery & cable

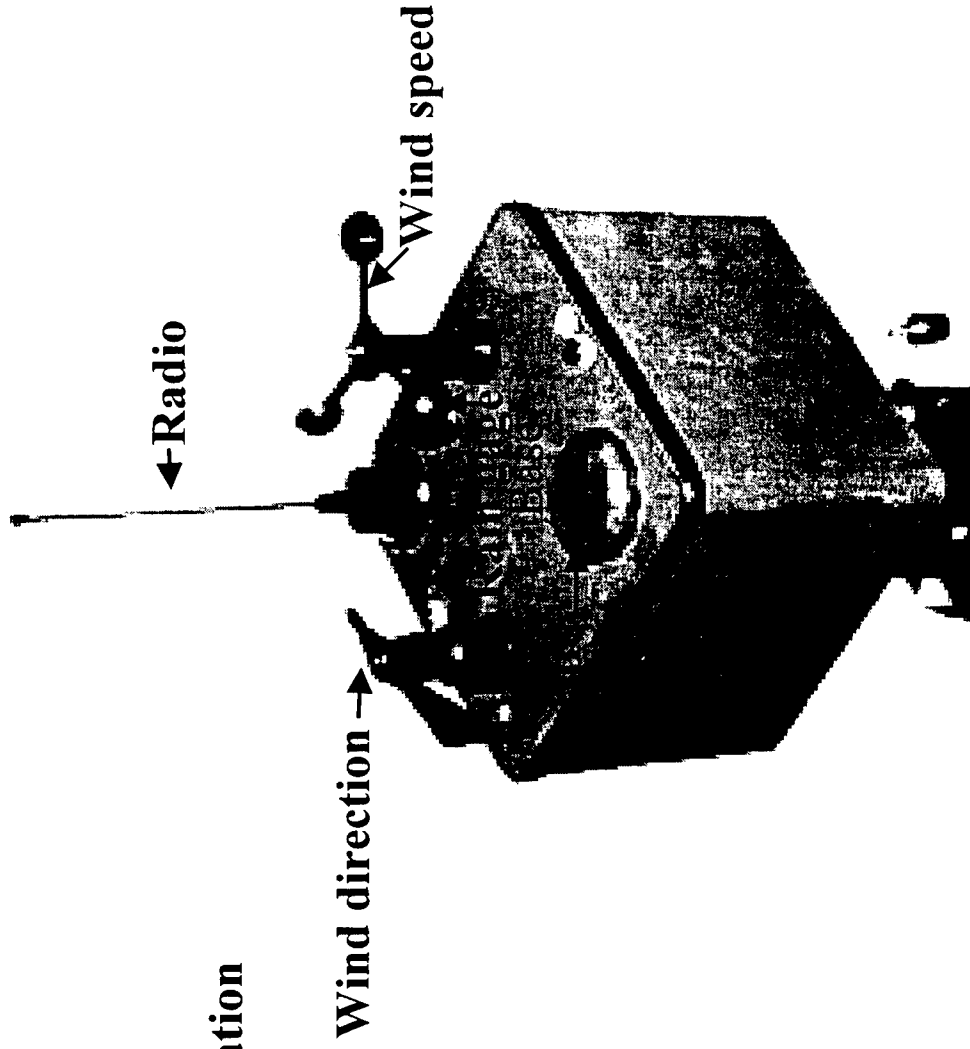


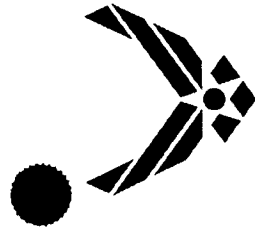
CBAWS Components

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- Tier I (cont.)

- Advantages:
 - GPS
 - Meteorological weather station
- Limitations:
 - False alarm rate
 - Subject to tampering
 - Daily battery maintenance
- Solution:
 - Altered algorithm
 - Connected to TASS



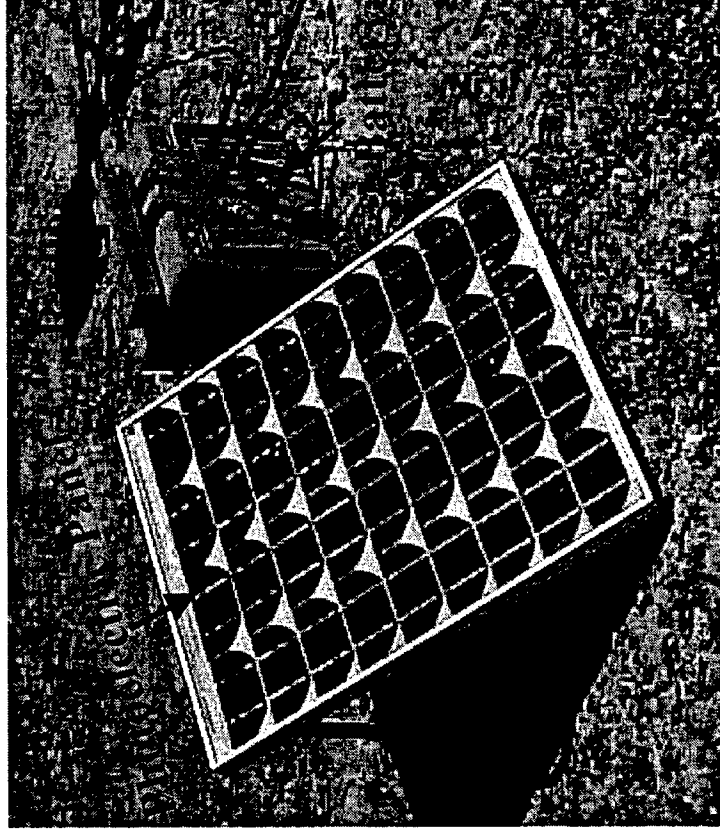


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CBAWS Components

– TASS (Tactical Automated Sensor System)

- Status: Fielded**
- Advantages:**
 - Battery**
 - Photoelectric panel recharger**
 - Radio**
 - Tamper detection**
 - Low battery alert**
 - Simple to operate**
 - One-man portable/deployable**
- Limitations: Needs adapter cables**
- Solution: Built cables**





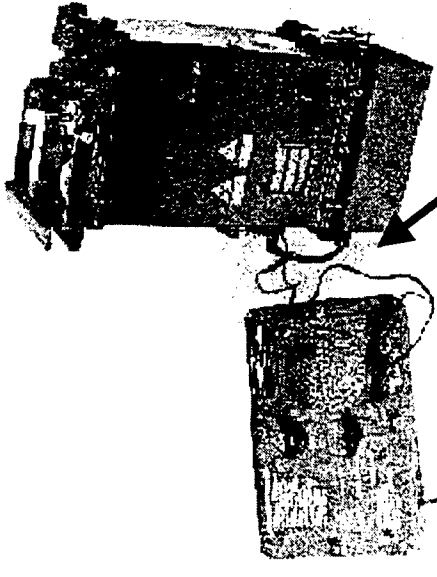
CBAWS Components

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– ACADA

- Status: Being fielded
- Sensor: Ion mobility spectrometry
- Advantages:
 - Gives generic nerve or blister agent ID
 - One-man portable & deployable
 - Battery operated
 - RS 232 connection
 - Simple to operate
- Limitations:
 - Limited by M42's 400M range
 - Alarm difficult to hear in noisy environments
 - Subject to tampering
 - Battery maintenance
- Solution:
 - Connect to Tier I radio
 - Connected to TASS

ACADA



M42 alarm

400M Com. wire

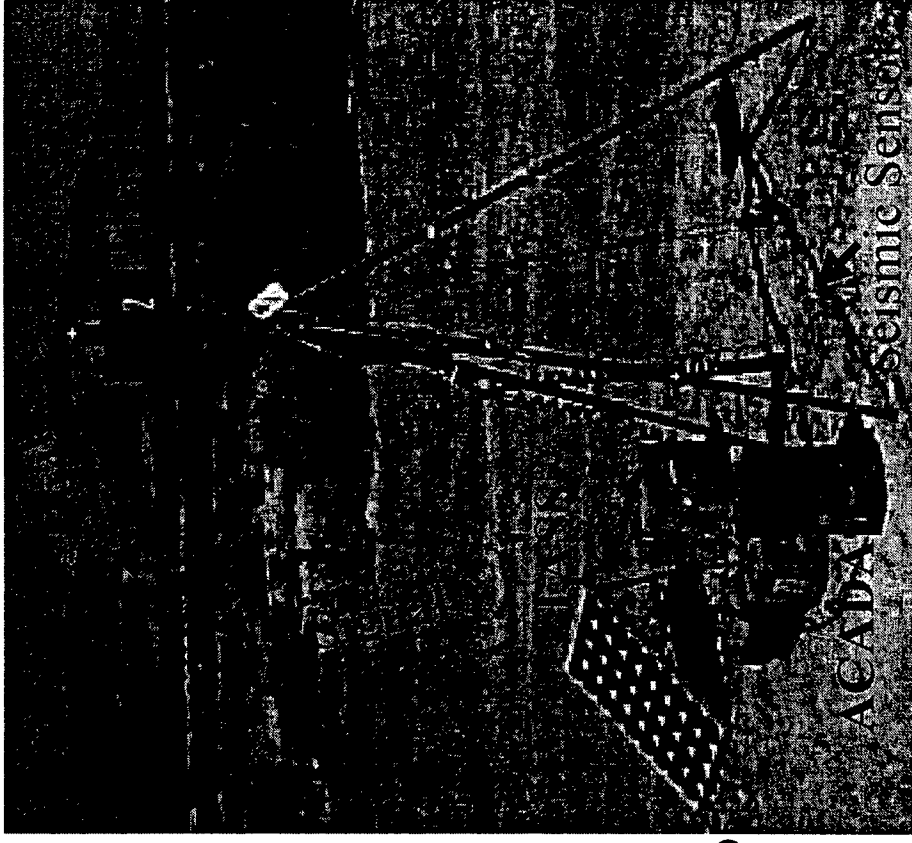


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CBAWS Components

– True alert to warn, stand off CB sensor system

- Combines GOTS:**
 - Tier I (shelved)**
 - ACADA (limited range)**
 - TASS (successfully fielded)**
- Advantages:**
 - 13 Km range**
 - Wireless (radio)**
 - Tamper detection**
 - Low battery alert**
 - Limited maintenance**
 - One man portable/deployable**
 - Bio sample collection**
 - Simple - 1 hr training, 5 Min setup**



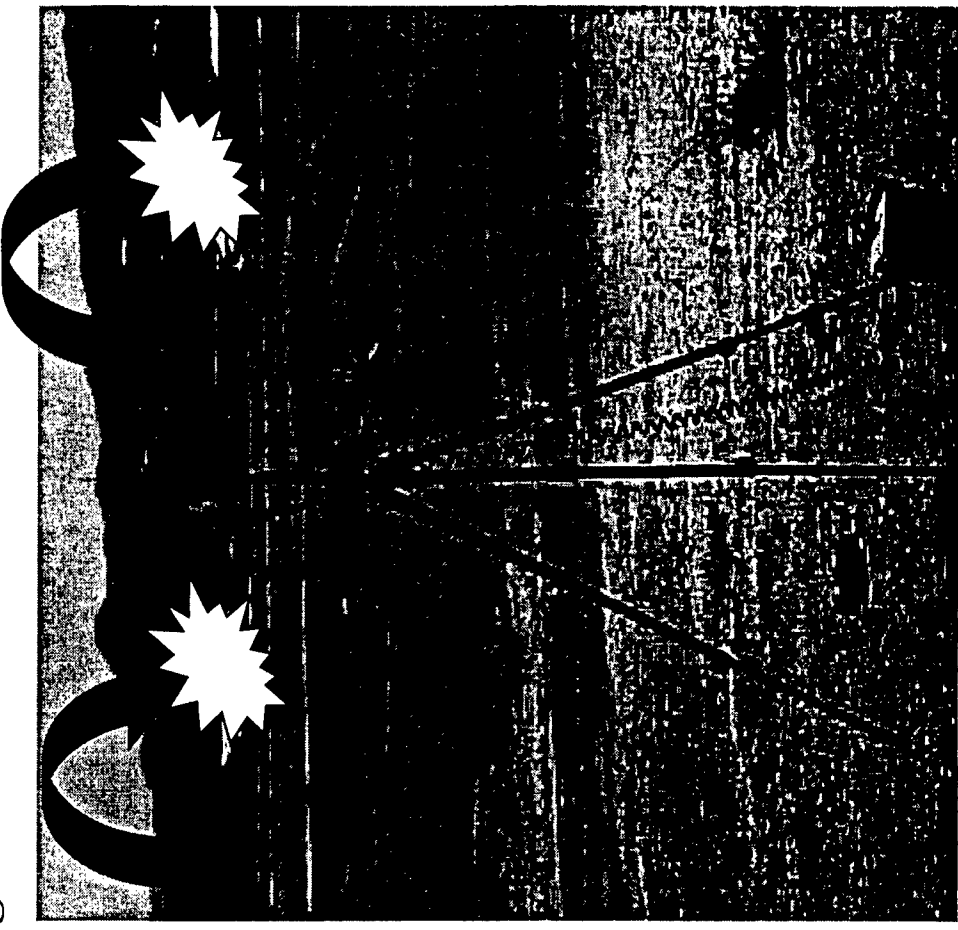


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CBAWS Components

- True alert to warn, stand off CB sensor system (cont.)
 - Limitations:
 - Generic CB identification
 - Possible false alarms
 - Could be circumvented
 - Solution: Algorithm, Tier III, M21, RAPID & M256

Agent delivered over alert-to-warn sensors



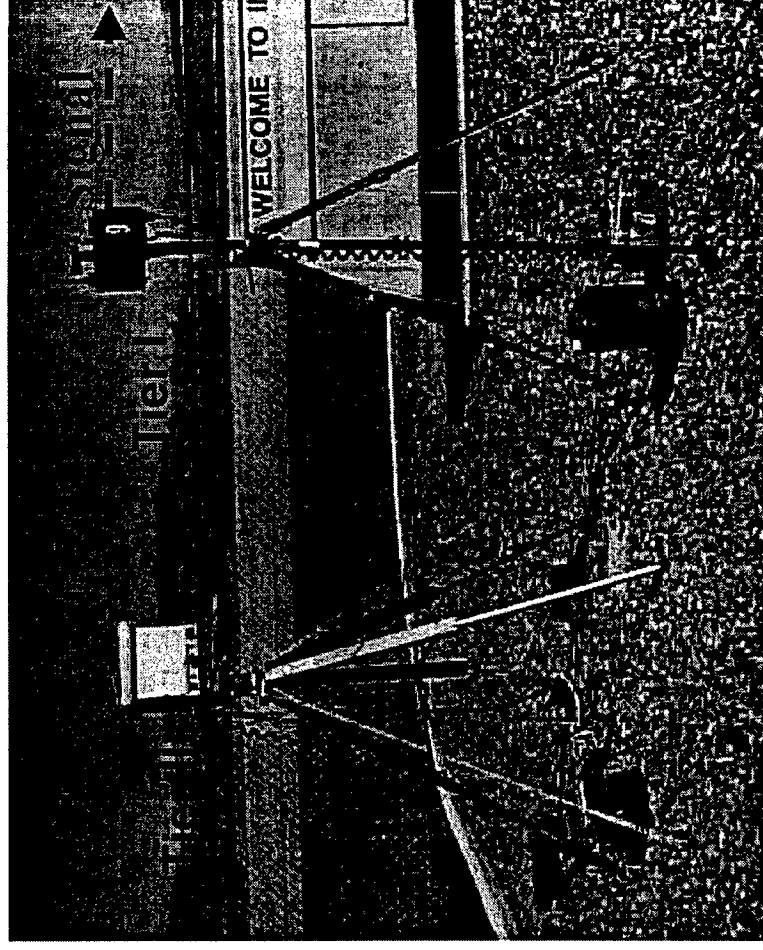


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CBAWS Components

– Tier III

- Status: Early prototype**
- Sensor: Passive UV Laser**
- Advantages:**
 - ID's if particle cloud is biological**
 - One-man portable & deployable**
 - Simple to operate**
- Limitations:**
 - Subject to tampering**
 - Prototype**
- Solution:**
 - Tied to Tier I radio**
 - Used TASS tamper detection**
 - Deployed one per 10 Tier I's**



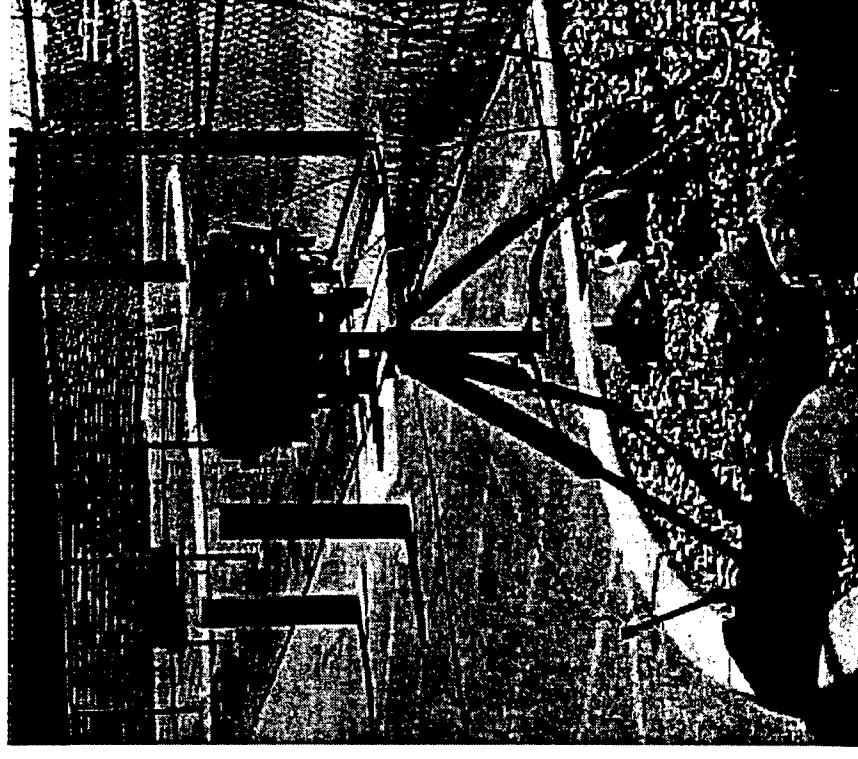


CBAWS Components

U.S. AIR FORCE

– M21

- Status: Being fielded
- Sensor: Passive infrared detector
- Advantages:
 - Gives generic nerve or blister agent ID
 - One-man portable & deployable
 - 5 mile range
 - Simple to operate
- Limitations:
 - AC power
 - 60° window (need more than one)
 - Direct cable to base station
- Solution: Replace with next generation IR detector





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CBAWS Components

— Base station

— Components:

- PC Analysis Work Station (PAWS)
- Telemetry transceiver (GPS)
- Simulation interface PC
- M42 alarm

—Advantages:

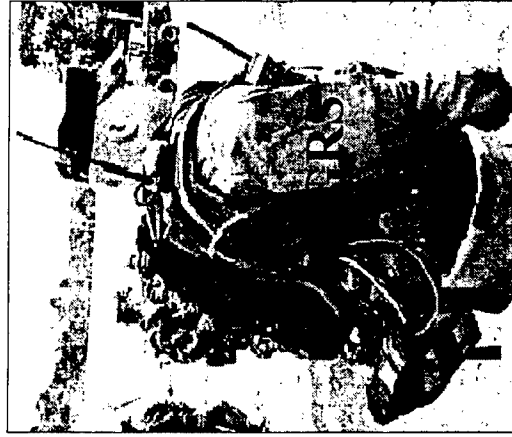
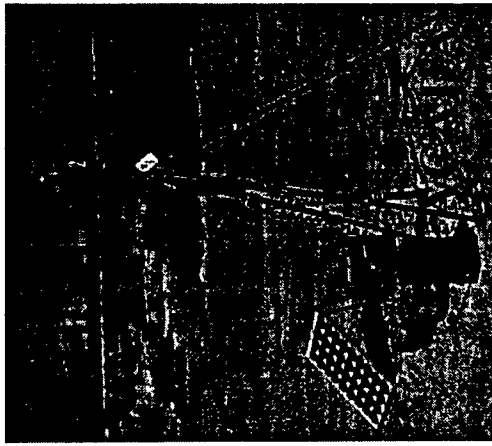
- Adjustable alarm thresholds
- Displays condition yellow then red
- Sounds M42 alarm
- Sends NBC reports
- Can send warning to personnel (beepers)
- Remotely diverts air flow to collect bio sample
- Displays all meteorological data
- One man portable/deployable
- Simple - 3 hr training, 1 Hr setup
- Supports digital rehearsals
- Limitations: Requires AC power



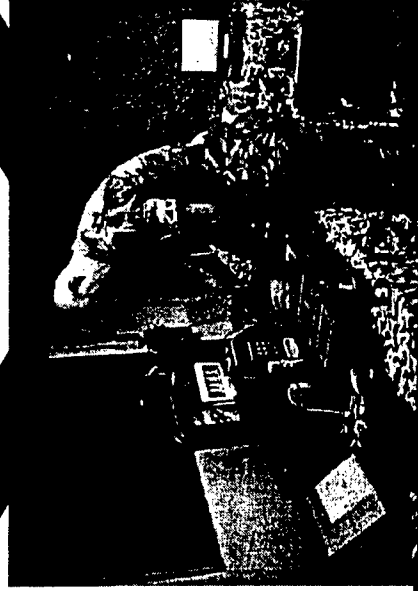


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Generic CB Alert To Warn



< 1 Min.



Real time



CSC2

Innovus Defensor Fortis

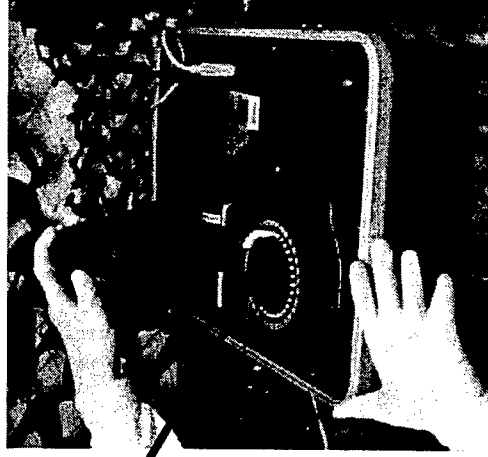


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Specific Alert To Treat

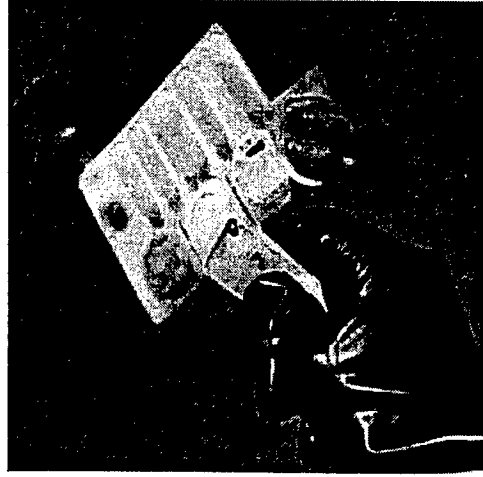


Biological: PCR with the Ruggedized
Advanced
Pathogen
Identification
Device



< 3 hours from first alert

Chemical: M256A1 or
M18A1
kits
in
minutes



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Deployable

Small Footprint



- 20 Tier I sensor-hubs
- 20 Tier I tripods
- 1 Tier III UV sensor
- 1 Tier III tripod
- Batteries
- Cables
- Chargers
- Antenna
- Base station
- RAPID
- PCR expendables

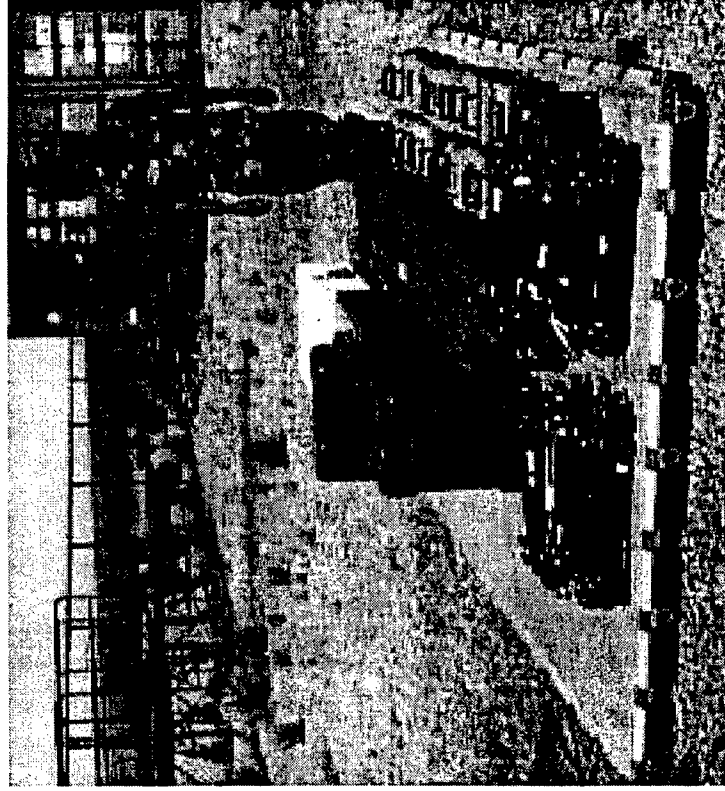
This is a 30 day mission load!



U.S. AIR FORCE

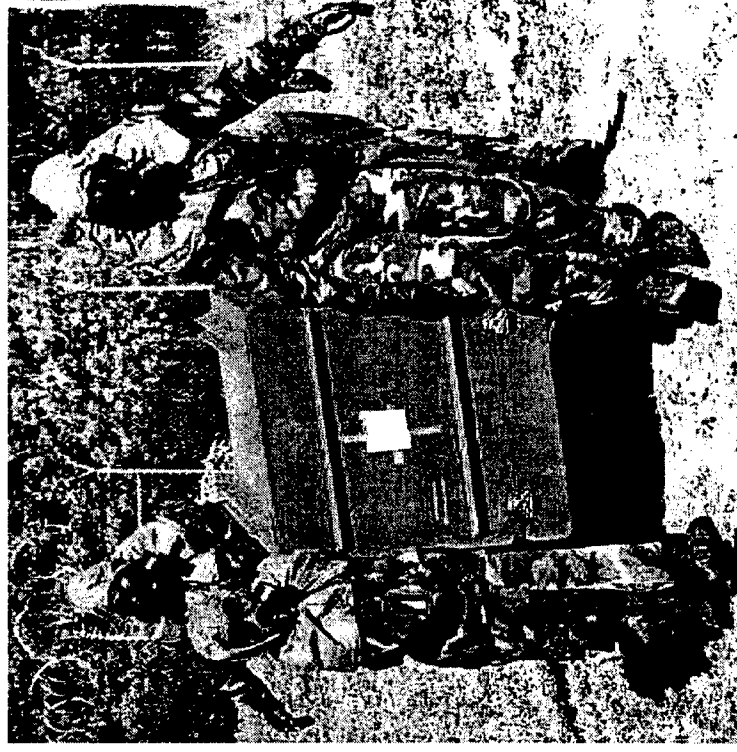
CBAWS vs. JBPDS

CBAWS Total Kit (20 units)



**This is a 30 day mission load!
Small Footprint**

JBPDS (1 unit)



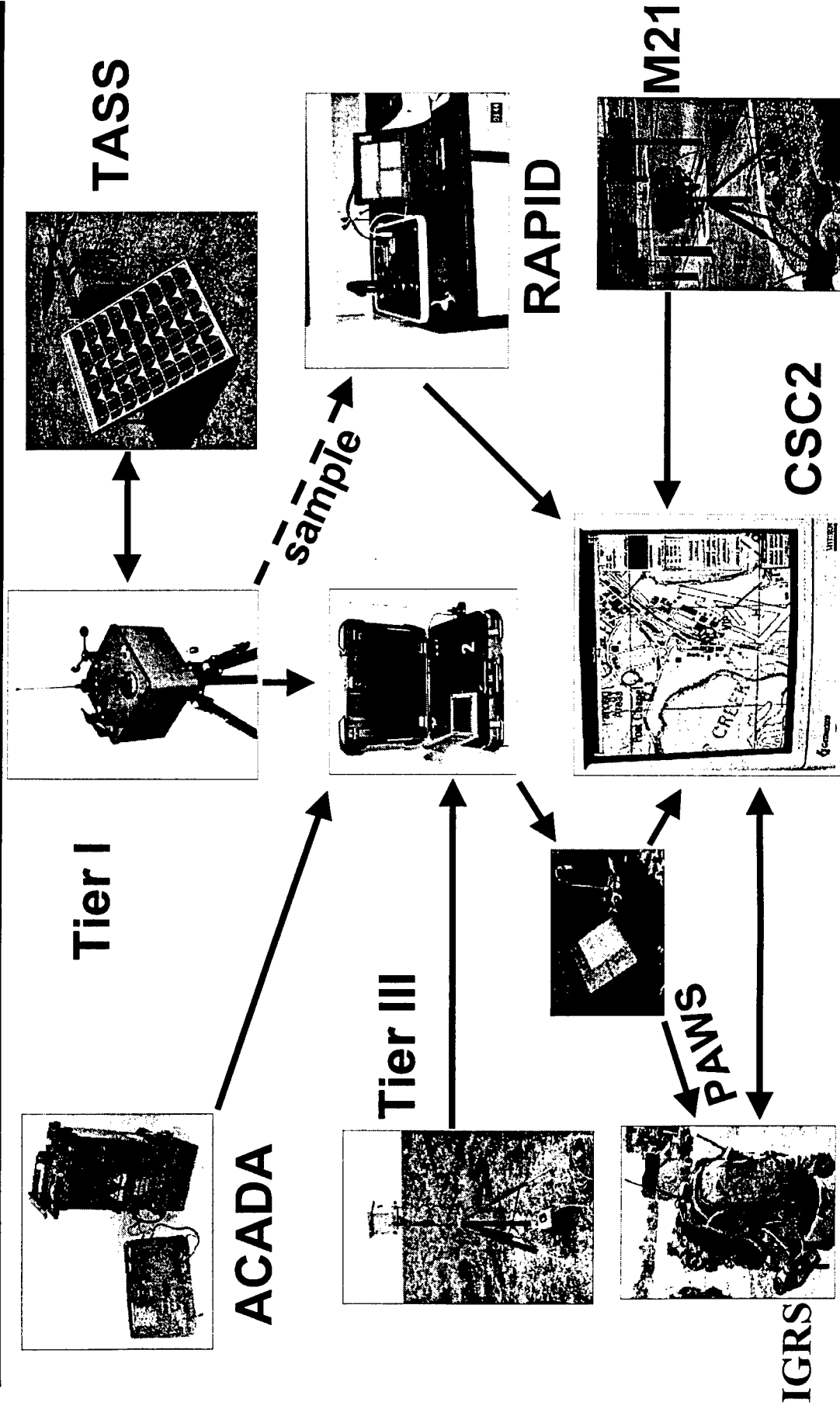
**2 Pieces, 300⁺ lbs. ea.
plus generator**



Chem/Bio Alert and Warning System

(CBAWS)

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Current Status

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- Army field testing completed:
 - 1-25 Jun 99, Dugway Proving Grounds, UT
 - 2-6 Aug 99, Fort Leonard Wood, MS
 - 16-20 Aug 99, ULCI FOCUS LENS 99, Yakima, WA
- Air Force field testing completed:
 - 25 Aug - 3 Sep 99, JEFX 99, Indian Springs, NV
 - 26 Jul - 5 Aug 00, JEFX Spiral 3, Indian Springs, NV
 - 1-16 Sep 00, JEFX 00 Execution, Indian Springs, NV
- Air Force field testing planned:
 - 22-26 Jan 01, 820 SFG, Mountain Home AFB, ID



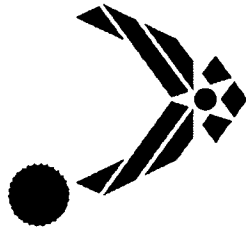
Current Status

U.S. AIR FORCE

– **Pursuing transition to end-user:**

- Collaborating with ESC/FD and 311th HSW/YA (lead)
- System will be deployed in a two phases:
 - Block 1:
 - Rapid fielding by using COTS/NDI items (3400, O&M funds)
 - Prepare 1 kit (from existing equipment) with 3 options
 - Kit ready within 6 months after receipt of 3400 funds at YA
 - Block 2:
 - Product improvement to block I, effort to include:
 - Incorporate new hardware (JCAD, JSLCAD, and upgrade BAWS)
 - Incorporate latest JWARN software, hardware interface and communications protocols

Streamlined COTS/NDI acquisition approach



Current Status

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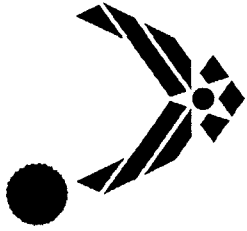
- **Aggressively seeking sponsorship**
 - 12 Oct HQ USAF/SGX briefing
 - 25 Oct TSWIG briefing
 - 7 Nov 00, ACC FP IPT briefing
 - 8 Nov 00, JSIG briefing
 - 9 Nov 00, J-34 briefing
 - 9 Nov 00, RESOPS ACTD briefing
 - 13 Dec 00, Medical Readiness Symposium
 - 14 Dec 00, HQ USAF/SG & GO Council
 - 10 Jan 01, USD/DDR&E & DATSD/CBDP
 - __ CENTAF/CC
 - __ HQ ACC/ILE briefings (working)
 - __ JSMG briefing (planned)
 - __ CENTCOM (planned)
 - __ SOCOM (Planned)
 - __ AFSOC (planned)
 - __ PACAF (planned)
-



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Bottom Line

- A true alert-to-warn CBAWS is possible using COTS & GOTS
 - Includes alert-to-treat chemical identification in minutes
 - Includes alert-to-treat biological agent identification in < 3 hrs
 - One-man portable/deployable & fits on 1/3 of a pallet
- CBAWS has limitations & requires risk management
 - Tactical for first-in, light weight, mobile, 786 CRG, 820 SFG type forces
 - Alert-to-warn CB sensor false alarms minimized but still possible
 - Better in certain environments than others
- There is still work to be done
 - Need CONOPS
 - Need AFOTEC testing
 - Need biological identification probe freeze-drying
 - Need to resolve certain configuration issues



Summary

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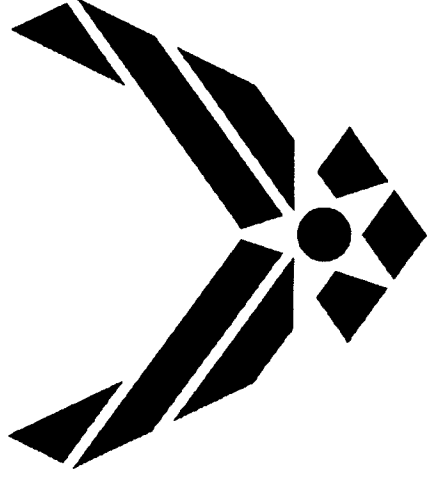
- Users have an immediate need for chem-bio detect to warn capability
- CBAWS has been successfully demonstrated in five test/exercises to meet this need
- AF 311 HSW/YA has draft acquisition plan in coordination
- Seeking consensus
- Firming up sponsorship:
 - Immediate funding for 1st Block 1 basic kit
 - Funding for Block 1 enhancements
 - Launch Block 2

USAF Force Protection Battlelab

Innovus Defensor Fortis

Deployed Environmental Surveillance System

Lt Col James A. Swaby



U.S. AIR FORCE

Lt Col James Swaby



DESS Initiative Description

U.S. AIR FORCE

Initiative Name: Deployed Environmental Surveillance System (DESS)

Problem: Not fully addressing Public Law 105-85 requirement to monitor individual environmental exposures during contingency operations

Innovative Concept: Can we monitor the environmental exposure of each individual during contingency operations?

Demonstration Mission Statement: Demonstrate the utility of combining use of forward-deployed agile, Chemical, Biological, Radiological, Nuclear (CBRN) detection and identification units with combined environmental hazard databases linked to central consultative services

Solution set: COTS & GOTS, CBRN detection/identification technologies tied to reach-back environmental databases & consultants

Proposed Partners: 786 CRG, 820 SFG, AFIERA, AFIP, AFRL, MSBL, SBCCOM, SWIBR & USDA

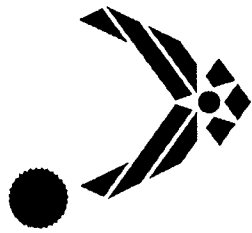
Proposed Sponsorship: HQ ACC/SG



DESS Objectives

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- Capture individual CBRN exposures
 - Use a suite of individually worn sensor technologies
 - Tie to one-man portable/deployable identification technologies
 - Directly/immediately capture/transmit data
- Provide a network solution for distribution & accessing of information
- Create an aggregate CBRN view at the data input level
 - Display dynamic real-time CBRN hazard input, assessment & tracking
 - Link to rear-based CBRN databases & consultants
 - Facilitate immediate, front-line analysis & rapid decision making
- Give tactical & medical commander instantaneous CBRN picture
 - Enhance force protection situational awareness & decision making
 - Provide preliminary CBRN assessment
 - Baseline assessment through real-time database/consultant linkage
- Use one-man deployable COT & GOTS technologies with small footprint

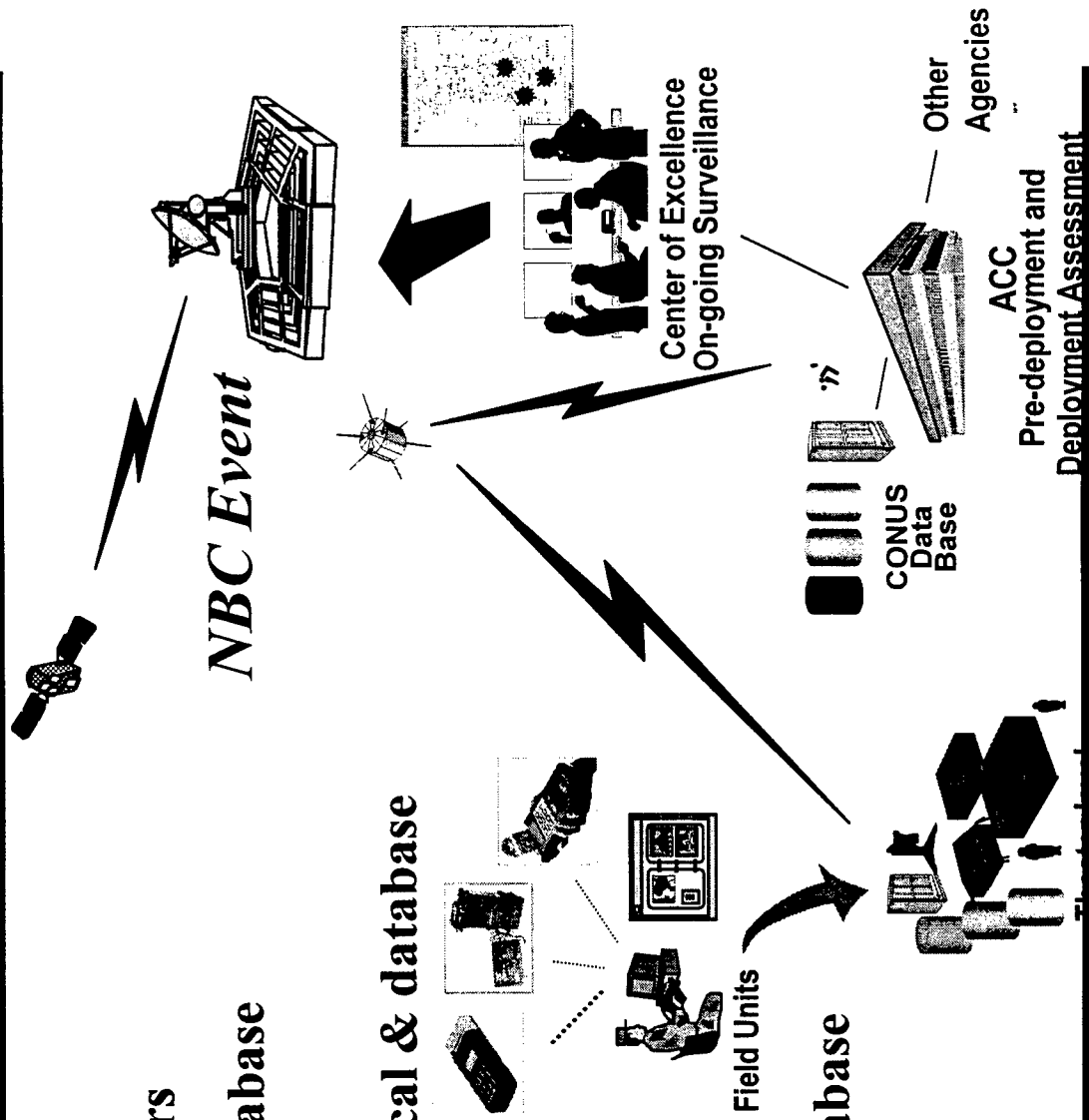


DESS Components

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Components:

- (1) Individual exposure monitors
- (2) 1st echelon analytical & database capabilities
- (3) In theater enhanced analytical & database capabilities.
- (4) Robust, deployable analytical & consultative capabilities
- (5) Reach back, gold standard analytical, consultative, & database capabilities





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DESS Projected Schedule

Aug 00 - Mar 01:	Database & technology market survey (AFIERA & CTC)
Jan - Jun 01:	Initial Biological, Chemical & Radiological technology & procedures assessment
Mar - Jun 01 :	Combined technologies & database integration
Jun - Aug 01:	Initial field testing
Sep - Dec 01:	Demonstration
Jan - Feb 02:	Initiative final report



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DESS Current Status

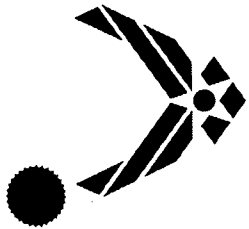
- Doing market survey**
 - Aggressively seeking sponsorship**
 - 12 Oct HQ USAF/SGX briefing**
 - 25 Oct TSWIG briefing**
 - 7 Nov 00, ACC FP IPT briefing**
 - 8 Nov 00, JSIG briefing**
 - 9 Nov 00, J-34 briefing**
 - 9 Nov 00, RESOPS ACTD briefing**
 - 13 Dec 00, Medical Readiness Symposium**
 - 14 Dec 00, HQ USAF/SG & GO Council**
 - __ HQ ACC/SG, & ILE briefings (working)**
 - __ PACAF (planned)**
 - __ AFSOC (planned)**
 - __ JSMG briefing (planned)**
-



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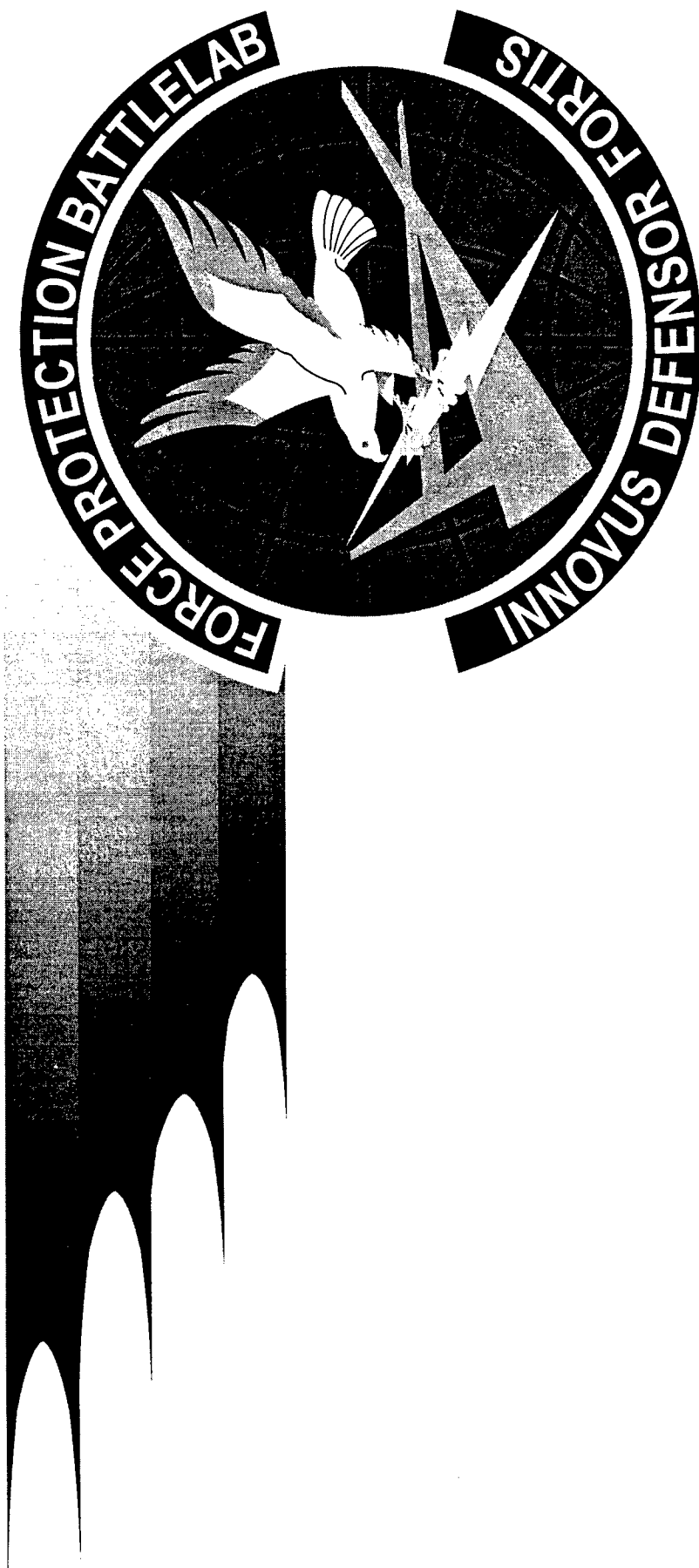
DESS Summary

- Not fully meeting Public Law 105-85
- Only have 18 months to complete initiative
- Concurrently working:
 - Requirements
 - Sponsorship
 - Partnerships
 - Proof of Concept: market survey
 - Transition/acquisition



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Questions?





BATTLE SPACE BATTLE LAB



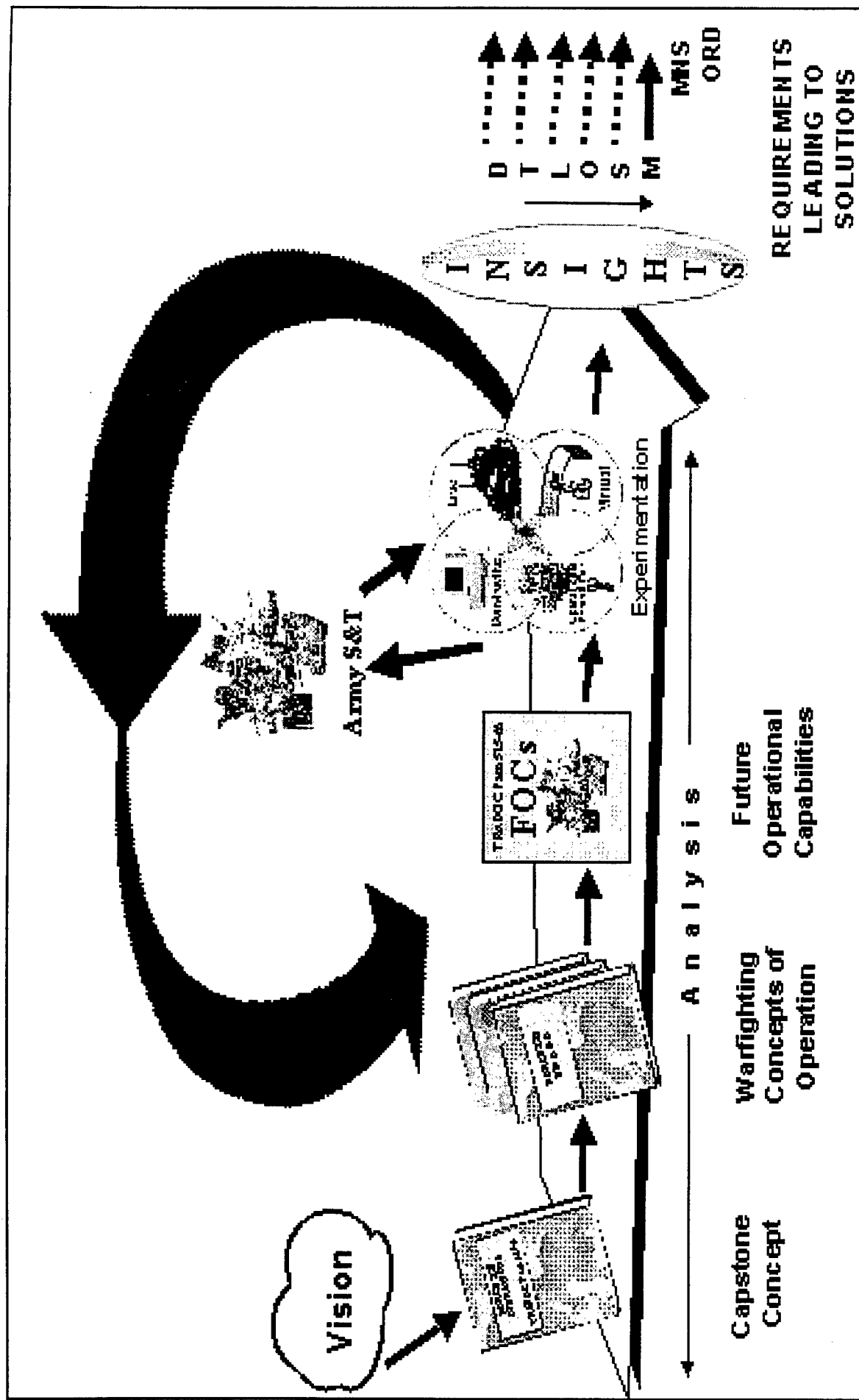


**Special Operations
Low Intensity Conflict
SO/LIC 2001**

Colonel FRANK J. STONE
Director of Combat Developments
United States Army Infantry Center
Fort Benning, Georgia



REQUIREMENTS PROCESS





COMBINED BATTLE SPACE BATTLE LAB

**BATTLE LAB
DEP DIR/HQ
(COL Poody)**

**LIAISON
OFFICER
SECTION**

Maintains and enhances
close liaison relationship
with the labs and
organizations

AMC

DARPA

**DISMOUNTED
FORCES
DIVISION
(C Kearns)**

Conducts experiments
on Dismounted Soldier
Hardware, TTPs and
Warfighting Concepts

**BATTLE
COMMAND
DIVISION
(W Morimoto)**

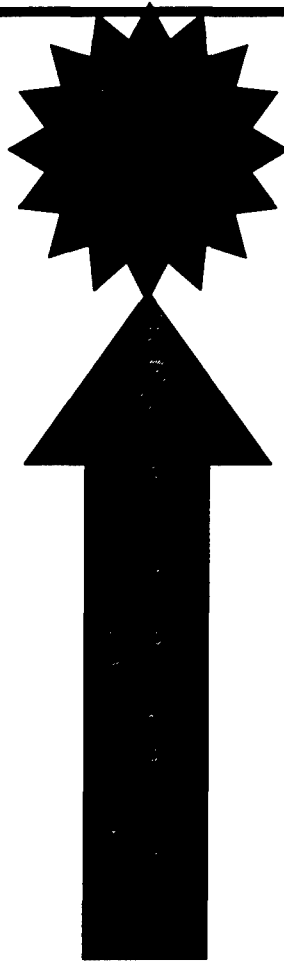
Conducts experiments
on C4I systems

**EXPANDED
BATTLESPACE
DIVISION
(MAJ Echols)**

Provides user
management and
oversight of the
MOU ACTD

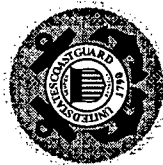
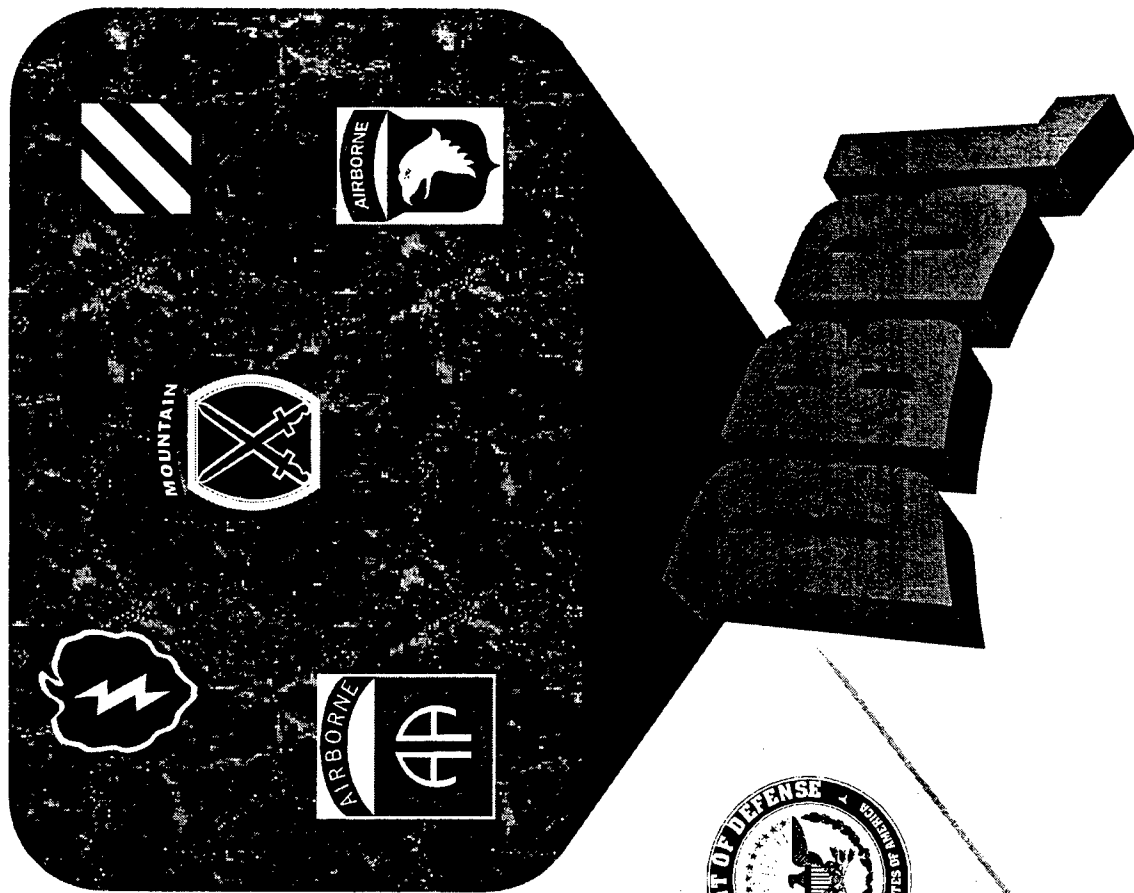
**LAND WARRIOR
SIMULATIONS
DIVISION
(J Chervenak)**

Provides simulation,
constructive and virtual
support to the DBBL and
Infantry School





AFFILIATIONS



Joint Services and Agencies



MEMBERSHIP PROGRAMS

- Dismounted Forces Division Programs
 - OSD Smart Sensor Web(SSW) and Antipersonnel Landmine Alternative (APLA)
 - Countersniper (to include Countersniper ACTD)
 - DARPA Small Unit Operations / Tactical Mobile Robotics / Exoskeleton
 - Combat Identification for the Dismounted Soldier
 - Own the Night
 - Enhanced Night Vision Goggle
 - Fused I2 and Thermal technology
 - LOSAT ACTD
 - Joint Non-Lethal Program
 - Under Barrel Tactical Payload System / Under Barrel Shotgun
 - Unmanned Ground and Aerial Vehicles (UGV / UAV)
 - Canadian/US Test and Evaluation Program - Experiment
- Battle Command Division
 - Light Digital TOC
 - Joint Enroute Mission Planning and Rehearsal System (JEMPRS)
- Expanded Battlespace Division
 - MOUT ACTD
 - Pointer UAV
 - Body Armor
 - Ladders
 - Rifle Launched Entry Munition (RLEM)
- Land Warrior Simulations Division
 - JANUS
 - CCTT
 - Land Warrior Test Bed



• Mckenna Military Operations In Urban Terrain (MOUT) Site

- On-site Lodging (Platoon)
- 3,700 ft Runway and Heliport
- 430 Acre Maneuver Area
- 15 Urban Structures 6 fully instrumented (inside tracking, cameras, audio)
- Tunnel System
- Preplanning and After Action Review Facility
- Day and Night camera coverage outside and inside selected buildings
- Control area for realtime monitoring of activities and data storage for AAR playback
- Observer Controllers
- Robotics Mobility Course under construction

• Griswold Range

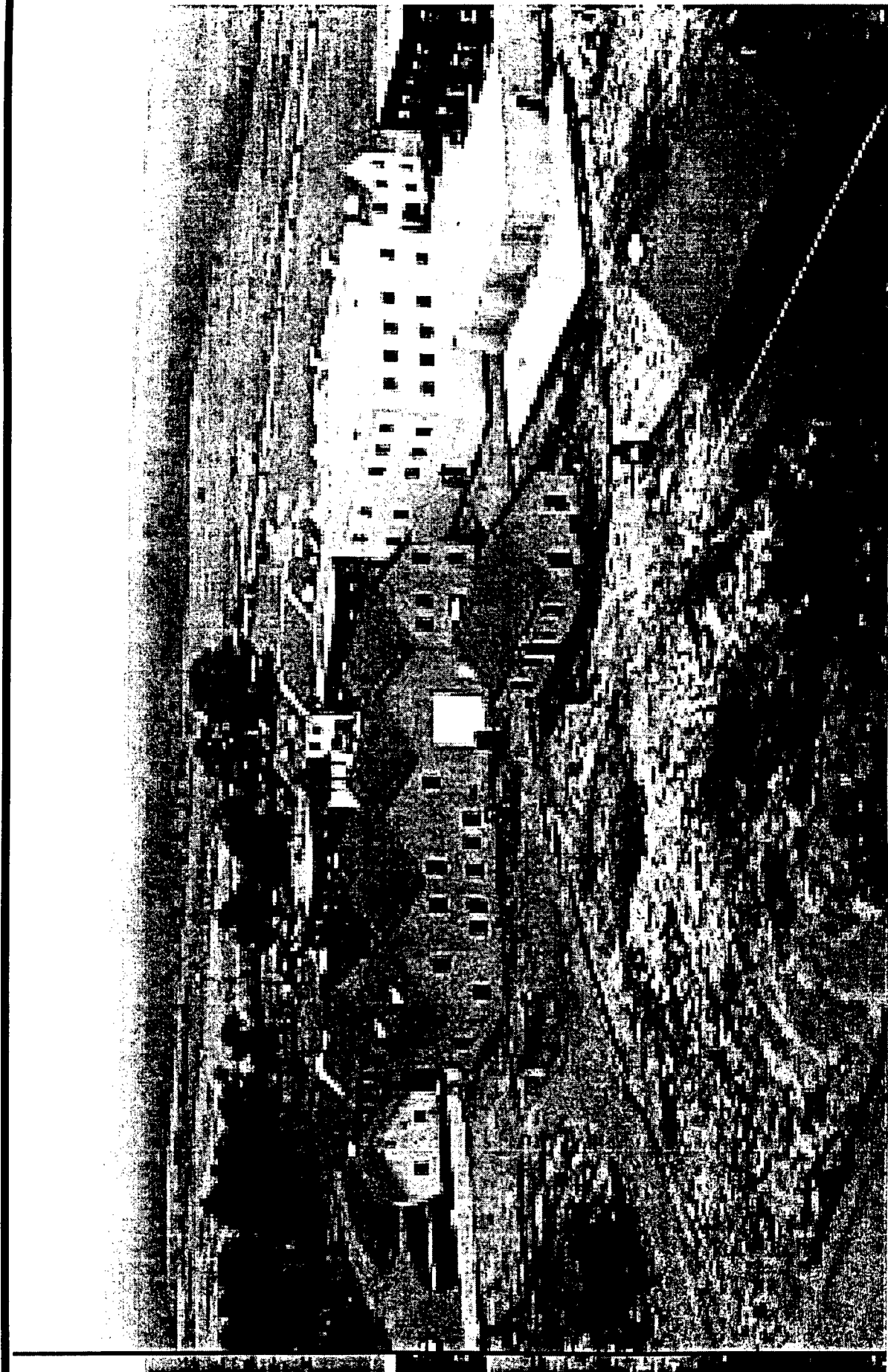
- 800 meter Known Distance firing range (5.56mm – 0.50 Cal)
- Upper firing point that adds 1,000 meters to the range providing 1,800 meter target engagements
- Maneuver area with forested terrain
- Support building for range support

• Kunzig Range

- Instrumented, Hardened Evaluation and Experimentation Tactical Objective
- Fenced in compound
- Two buildings and three out buildings
- Three acre livestock fenced area
- Four camera towers with day and night capability
- Fiber optic export of data to control facility at McKenna MOUT site



DISMOUNTED BATTLE SPACE BATTLE LAB

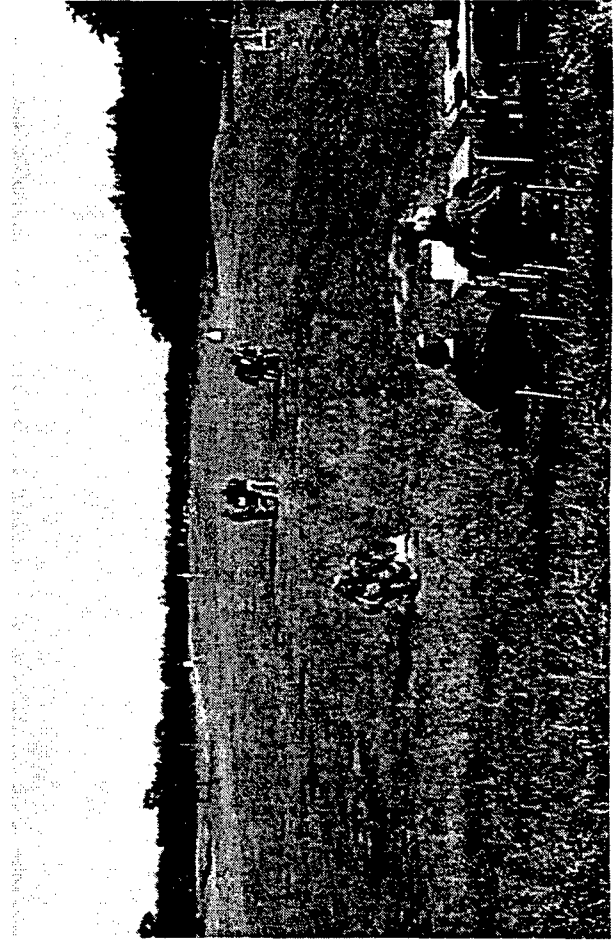
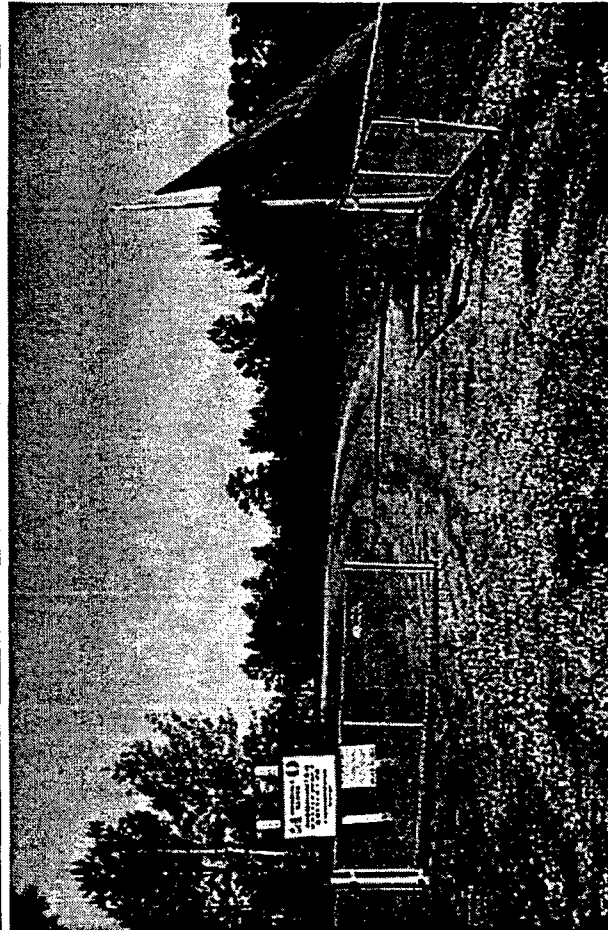


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WHERE TOMORROW'S VICTORIES BEGIN



4th Mounted Range





Change

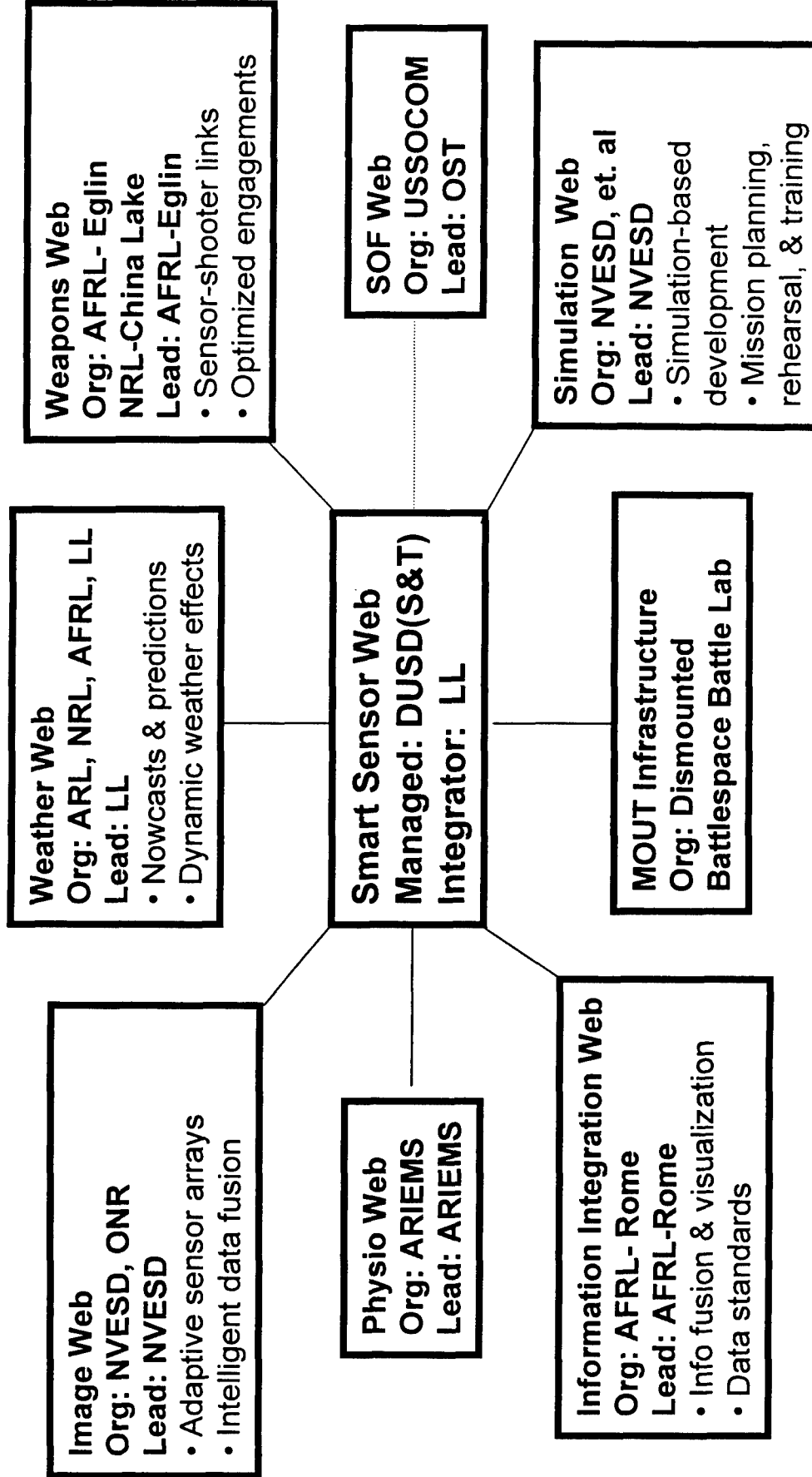




- Own-the-Night experiments
 - Thermal weapon sight evaluation Light, Medium and Heavy
 - Support the Enhanced Night Vision Goggle (ENVG) program
 - Supporting efforts for dismounted I2 and Thermal Fusion
- Combat Identification and training system prototypes
 - Man worn ground to ground
 - AC130H to ground
- Weapon and Weapons Concepts Experimentation
 - Multi-Role Anti-Armor Anti-Personnel Weapons System (MAAWS)
 - Under Barrel Shotgun
 - Future Sniper weapon concept exploration
- Preparation for experimentation of Sympathetic Detonation program
- Field evaluation of new battery technology
- Proponent support to White Feather and Inertial Sight Reticle program
- Hosted SOF WEB experiment for Smart Sensor Web
- Training support to 75th Ranger Regiment, selected ODAs from 5th and 7th SF Group and Navy SEALs



Sensor Web



10-18 July 2000



- Multi-Role Anti-Armor Anti-Personnel Weapons System (MAAWS) Area Deterrent Munitions (ADM)
- Conducted a User evaluation of the MAAWS ADM munition for SOCOM
- Determine the effectiveness and suitability of the ADM
- Support a type-classification standard and materiel release decision.
- Determine probability of hit at 50 and 100 meters during daylight and limited visibility and in Mission Oriented Protective Posture (MOPP) Levels 0 and 4